

Department of Environment and Natural Resources

Guideline for Ambient Air Quality Standards in the Northwest Territories

Carbon Monoxide (CO)
Fine Particulate Matter (PM_{2.5})
Ground Level Ozone (O₃)
Nitrogen Dioxide (NO₂)
Sulphur Dioxide (SO₂)
Total Suspended Particulate (TSP)

Introduction

This Guideline is established under the Government of the Northwest Territories' (GNWT) Environmental Protection Act and sets standards for the maximum concentrations of CO, PM_{2.5}, O₃, NO₂, SO₂, and TSP acceptable in ambient air throughout all of the Northwest Territories (NWT). These standards will be applied as an effects-based, long term management goal for air quality and are established at levels intended to protect human health and the environment. However, due to the non-threshold nature of O₃ and PM_{2.5}, the standards for those contaminants should not be considered as totally protective of human health.

Uses

The standards will be used to determine the acceptability of emissions from proposed and existing developments, and for reporting on the state of air quality in the NWT. They are harmonized with other Canadian jurisdictions and will ensure fair, predictable and consistent treatment of operators/operations.

Any actions to maintain or improve air quality will include consideration of factors such as the frequency and magnitude of exceedances, the size of the affected area, availability of control options and environmental, human health and socio-economic impacts.

Derivation

The standards for SO₂, CO, NO₂ and TSP are adopted from the Canadian National Ambient Air Quality Objectives (NAAQO). The NAAQO's are developed through scientific assessment, derivation of reference levels, assessment of monitoring technologies, economic benefits and public/stakeholder consultations.

The standards for O₃ and PM_{2.5} are adopted from the Canada Wide Standards (CWS). The CWS standards currently identify O₃ and PM_{2.5} as priority substances and represent a balance between a desire to achieve the best scientific health and environmental protection possible in the near term, and the feasibility and costs of reducing the smog-producing emissions.

Definitions

Ambient Air The air surrounding the earth, but does not include the air within a structure or within any underground space.

Carbon Monoxide (CO) CO is a colourless, odourless, and tasteless gas, highly toxic to humans and animals as it inhibits the blood's capacity to carry oxygen. It is formed during incomplete combustion of hydrocarbon based fuels, and is emitted directly from vehicle tailpipes, generators, lawn mowers, etc. Other lesser but significant sources are the wood industry, residential wood heating, and forest fires.

Chief Environmental Subsection 3(1) of Protection Officer The Chief Environmental Protection Officer under the GNWT Environmental Protection Act.

Fine Particulate Matter (PM_{2.5}) Airborne microscopic solid or liquid particles with a diameter of 2.5 micrometers (1 millionth of a metre) or less; can be directly emitted or formed due to reaction of *precursor pollutants*; a component of photochemical smog and associated with a range of human health concerns, especially cardio-respiratory impacts, and visibility degradation

Ground Level Ozone (O ₃)	A highly reactive gas; termed a secondary pollutant since it is not directly emitted but formed due to the chemical reaction of <i>precursor pollutants</i> in the presence of heat and sunlight; a component of photochemical smog and associated with human health concerns, environmental impacts and property damage. It should not be confused with the desirable ozone in the upper reaches of the atmosphere.
Nitrogen Dioxide (NO ₂)	One of a group of highly reactive gasses known as "oxides of nitrogen", NO ₂ forms quickly from emissions from internal combustion engines (cars, trucks, buses, power plants, etc). In addition to contributing to the formation of ground-level ozone and fine particulate matter, NO ₂ is linked to a number of adverse effects on the respiratory system. NO ₂ is also a primary contributor to acid rain formation which is damaging to aquatic and terrestrial ecosystems.
Precursor Pollutants	Directly emitted compounds that chemically react or combine to form other pollutants in the atmosphere.
Sulphur Dioxide (SO ₂)	A colourless gas primarily emitted due to the combustion of fossil fuels and associated with human health and environmental impacts.
Total Suspended Particulate (TSP)	Airborne solid and liquid particles with a wide variety of size ranges, commonly referred to as "dust"; the larger sized particulate is generally associated with aesthetic and environmental impacts but the smaller sizes (e.g. PM2.5) contained within TSP are a human health concern.

NWT Ambient Air Quality Standards

Parameter	Standard ($\mu\text{g}/\text{m}^3$) [*]	Standard (ppb_v) ^{**}
Carbon Monoxide (CO) 1 hr average 8 hr average	15,000 6,000	13,000 5,000
Fine Particulate Matter (PM _{2.5}) 24 hr average	30	
Ground Level Ozone (O ₃) 8 hr average	130	65
Nitrogen Dioxide (NO ₂) 1 hr average 24 hr average Annual arithmetic mean	400 200 60	213 106 32
Sulphur Dioxide (SO ₂) 1 hr average 24 hr average Annual arithmetic mean	450 150 30	172 57 11
Total Suspended Particulate (TSP) 24 hr average Annual arithmetic mean	120 60	

^{*}micrograms per cubic metre

^{**}parts per billion by volume

All ambient air quality measurements will be referenced to standard conditions of 25°C and 101.3 kPa.

This list is not exhaustive, and specifically does not support uncontrolled levels of other air contaminants. Standards from other jurisdictions for industry-specific air quality parameters that are not included in this document may be accepted with according rationalization.

Detailed information on calculation of the averaging periods for O₃ and PM_{2.5} can be found in the Canada-wide Standards Guidance Document on Achievement Determination, ([hyperlink to http://www.ccme.ca/assets/pdf/1391_qdad_e.pdf](http://www.ccme.ca/assets/pdf/1391_qdad_e.pdf)) available on the CCME website.

The Chief Environmental Protection Officer may request for ambient air measurements to be made in a specified manner.

For further information, please contact:
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